



Scientific publications PIENTER-Corona study

Antibodies against SARS-CoV-2 in the Netherlands during the COVID pandemic and risk factors

- [SARS-CoV-2–Specific Antibody Detection for Seroepidemiology: A Multiplex Analysis Approach Accounting for Accurate Seroprevalence.](#)
Den Hartog G, Schepp RM, Kuijer M, GeurtsvanKessel C, van Beek J, Rots N, Koopmans MPG, van der Klis FRM, van Binnendijk RS.
The Journal of Infectious Diseases 2020; 222(9):1452-1461.
- [Nationwide seroprevalence of SARS-CoV-2 and identification of risk factors in the general population of the Netherlands during the first epidemic wave.](#)
Vos ERA, den Hartog G, Schepp RM, Kaaijk P, van Vliet J, Helm K, Smits G, Wijmenga-Monsuur A, Verberk JDM, van Boven M, van Binnendijk RS, de Melker HE, Mollema L, van der Klis FRM. Journal of Epidemiology & Community Health 2020; 75(6):489–95.
- [Trends in SARS-CoV-2 seroprevalence amongst urban paediatric patients compared with a nationwide cohort in the Netherlands.](#)
Rotee ILM, Ong DSY, Koeleman JGM, Vos ERA, Tramper-Stranders GA.
Journal of Clinical Virology Plus 2021; 1(4):100045.
- [Associations Between Measures of Social Distancing and Severe Acute Respiratory Syndrome Coronavirus 2 Seropositivity: A Nationwide Population-based Study in the Netherlands.](#)
Vos ERA, van Boven M, den Hartog G, Backer JA, Klinkenberg D, van Hagen CCE, Boshuizen H, van Binnendijk RS, Mollema L, van der Klis FRM, de Melker HE.
Clinical Infectious Diseases 2021; 73(12):2318-2321.
- [SARS-CoV-2 Seroprevalence Trends in the Netherlands in the Variant of Concern Era: Input for Future Response.](#)
Vos ERA, van Hagen CCE, Wong D, Smits G, Kuijer M, Wijmenga-Monsuur AJ, Kaczorowska J, van Binnendijk RS, van der Klis FRM, den Hartog G, de Melker HE.
Influenza and other respiratory viruses 2024; 18(6):e13312

Infection, immunity and protection

- [Persistence of Antibodies to Severe Acute Respiratory Syndrome Coronavirus 2 in Relation to Symptoms in a Nationwide Prospective Study.](#)
Den Hartog G, Vos ERA, van den Hoogen LL, van Boven M, Schepp RM, Smits G, van Vliet J, Woudstra L, Wijmenga-Monsuur AJ, van Hagen CCE, Sanders EAM, de Melker HE, van der Klis FRM, van Binnendijk RS.
Clinical Infectious Diseases 2021; 73(12):2155-2162.
- [Seropositivity to Nucleoprotein to detect mild and asymptomatic SARS-CoV-2 infections: A complementary tool to detect breakthrough infections after COVID-19 vaccination?](#)
van den Hoogen LL, Smits G, van Hagen CCE, Wong D, Vos ERA, van Boven M, de Melker HE, van Vliet J, Kuijer M, Woudstra L, Wijmenga-Monsuur AJ,

GeurtsvanKessel CH, Stoof SP, Reukers D, Wijsman LA, Meijer A, Reusken CBEM, Rots NY, van der Klis FRM, van Binnendijk RS, den Hartog G. Vaccine 2022; 40(15):2251-2257.

- [SARS-CoV-2 Spike S1-specific IgG kinetic profiles following mRNA or vector-based vaccination in the general Dutch population show distinct kinetics.](#)
van den Hoogen LL, Verheul MK, Vos ERA, van Hagen CCE, van Boven M, Wong D, Wijmenga-Monsuur AJ, Smits G, Kuijer M, van Rooijen D, Bogaard-van Maurik M, Zutt I, van Vliet J, Wolf J, van der Klis FRM, de Melker HE, van Binnendijk RS, den Hartog G. Scientific Reports 2022; 12(1):5935.
- [Seropositivity to Nucleoprotein to detect mild and asymptomatic SARS-CoV-2 infections: A complementary tool to detect breakthrough infections after COVID-19 vaccination?](#)
van den Hoogen LL, Smits G, van Hagen CCE, Wong D, Vos ERA, van Boven M, de Melker HE, van Vliet J, Kuijer M, Woudstra L, Wijmenga-Monsuur AJ, GeurtsvanKessel CH, Stoof SP, Reukers D, Wijsman LA, Meijer A, Reusken CBEM, Rots NY, van der Klis FRM, van Binnendijk RS, den Hartog G. Vaccine 2022; 40(15):2251-2257.
- [A scenario modelling analysis to anticipate the impact of COVID-19 vaccination in adolescents and children on disease outcomes in the Netherlands, summer 2021.](#)
Ainslie KEC, Backer JA, de Boer PT, van Hoek AJ, Klinkenberg D, Korthals Altes H, Leung KY, de Melker H, Miura F, Wallinga J. Eurosurveillance 2022; 27(44):2101090.
- [Optimal vaccine allocation for COVID-19 in the Netherlands: A data-driven prioritization.](#)
Miura F, Leung KY, Klinkenberg D, Ainslie KEC, Wallinga J. PLOS Computational Biology 2021; 17(12):e1009697.
- [Protective mucosal SARS-CoV-2 antibodies in the majority of the general population in the Netherlands.](#)
Verheul MK, Kaczorowska J, Hofstee MI, Schepp RM, Smits GP, Wessels Beljaars D, Kuijer M, Schuin W, Middelhof I, Wong D, van Hagen CCE, Vos ERA, Nicolaie MA, de Melker HE, van Binnendijk RS, van der Klis FRM, den Hartog G. Mucosal Immunology 2024; 17(4):554-564.
- [Decline of RSV-specific antibodies during the COVID-19 pandemic](#)
Den Hartog G, van Kasteren PB, Schepp RM, Teirlinck AC, van der Klis FRM, van Binnendijk RS. The Lancet Infectious Diseases 2023; 23(1):23-25.
- [Antibody waning and Bordetella pertussis resurgence after the COVID-19 pandemic in the Netherlands](#)
Gaasbeek CM, Vos ERA, van Roon AM, van Meijeren D, Smits G, Kuijper M, Koopmans M, de Melker H, van der Klis FRM, van Binnendijk R, den Hartog G. Nature Communications 2026; 17, 2989.

Behaviour and healthcare usage during the pandemic

- [Associations Between Measures of Social Distancing and Severe Acute Respiratory Syndrome Coronavirus 2 Seropositivity: A Nationwide Population-based Study in the Netherlands.](#)
Vos ERA, van Boven M, den Hartog G, Backer JA, Klinkenberg D, van Hagen CCE, Boshuizen H, van Binnendijk RS, Mollema L, van der Klis FRM, de Melker HE. Clinical Infectious Diseases 2021; 73(12):2318-2321.

- [Impact of physical distancing measures against COVID-19 on contacts and mixing patterns: repeated cross-sectional surveys, the Netherlands, 2016–17, April 2020 and June 2020.](#)
Backer JA, Mollema L, Vos ER, Klinkenberg D, van der Klis FR, de Melker HE, van den Hof S, Wallinga J.
Eurosurveillance 2021; 26(8):2000994
- [Dynamics of non-household contacts during the COVID-19 pandemic in 2020 and 2021 in the Netherlands.](#)
Backer JA, Bogaardt L, Beutels P, Coletti P, Edmunds WJ, Gimma A, van Hagen CCE, Hens N, Jarvis CI, Vos ERA, Wambua J, Wong D, van Zandvoort K, Wallinga J.
Scientific Reports 2023; 13(1):5166.
- [Contact behaviour before, during and after the COVID-19 pandemic in the Netherlands: evidence from contact surveys, 2016 to 2017 and 2020 to 2023.](#)
Backer JA, Vos ERA, den Hartog G, van Hagen CCE, de Melker HE, van der Klis FRM, Wallinga J.
Eurosurveillance 2024; 29(43):2400143.
- [The effect of SARS-CoV-2 testing on healthcare seeking behaviour at primary care level: implications for COVID-19 vaccine effectiveness estimates in test-negative design studies.](#)
van Hagen CCE, Vos ERA, Delaunay CL, de Melker HE, Kissling E, Knol MJ.
MedRxiv 2025

Disease burden, quality of life and long consequences

- [Age-specific severity of severe acute respiratory syndrome coronavirus 2 in February 2020 to June 2021 in the Netherlands.](#)
de Boer PT, van de Kasstelee J, Vos ERA, van Asten L, Dongelmans DA, van Gageldonk-Lafeber AB, den Hartog G, Hofhuis A, van der Klis F, de Lange DW, Stoeldraijer L; RIVM COVID-19 epidemiology and surveillance team; de Melker HE, Geubbels E, van den Hof S, Wallinga J.
Influenza and other respiratory viruses 2023; 17(8):e13174.
- [Estimating the asymptomatic proportion of SARS-CoV-2 infection in the general population: Analysis of nationwide serosurvey data in the Netherlands](#)
McDonald SA, Miura F, Vos ERA, van Boven M, de Melker HE, van der Klis FRM, van Binnendijk RS, den Hartog G, Wallinga J
European Journal of Epidemiology 2021; 36(7):735-739.
- [The estimated disease burden of acute COVID-19 in the Netherlands in 2020, in disability-adjusted life-years](#)
McDonald SA, Lagerweij GR, de Boer P, de Melker HE, Pijnacker R, Mughini Gras L, Kretzschmar ME, den Hartog G, van Gageldonk-Lafeber AB; RIVM COVID-19 surveillance, epidemiology team; van den F S, Wallinga J.
European Journal of Epidemiology 2022; 37(10):1035-1047.
- [Health-related quality of life during the COVID-19 pandemic: The impact of restrictive measures using data from two Dutch population-based cohort studies.](#)
Van Hagen CCE, Huiberts AJ, Mutubuki EN, de Melker HE, Vos ERA, van de Wijgert JHHM, van den Hof S, Knol MJ, van Hoek AJ.
PLOS One 2024; 19(3):e0300324.

- [The impact of SARS-CoV-2 on fatigue and quality of life in the early phase of the pandemic: prevalence of post COVID-19 condition among unvaccinated individuals in a Dutch population-based serosurveillance cohort](#)
Van Hagen CCE, Mutubuki EN, de Bruijn S, Vos ERA, den Hartog G, van der Klis FRM, van den Wijngaard CC, de Melker HE, van Hoek AJ.
MedRxiv 2024.